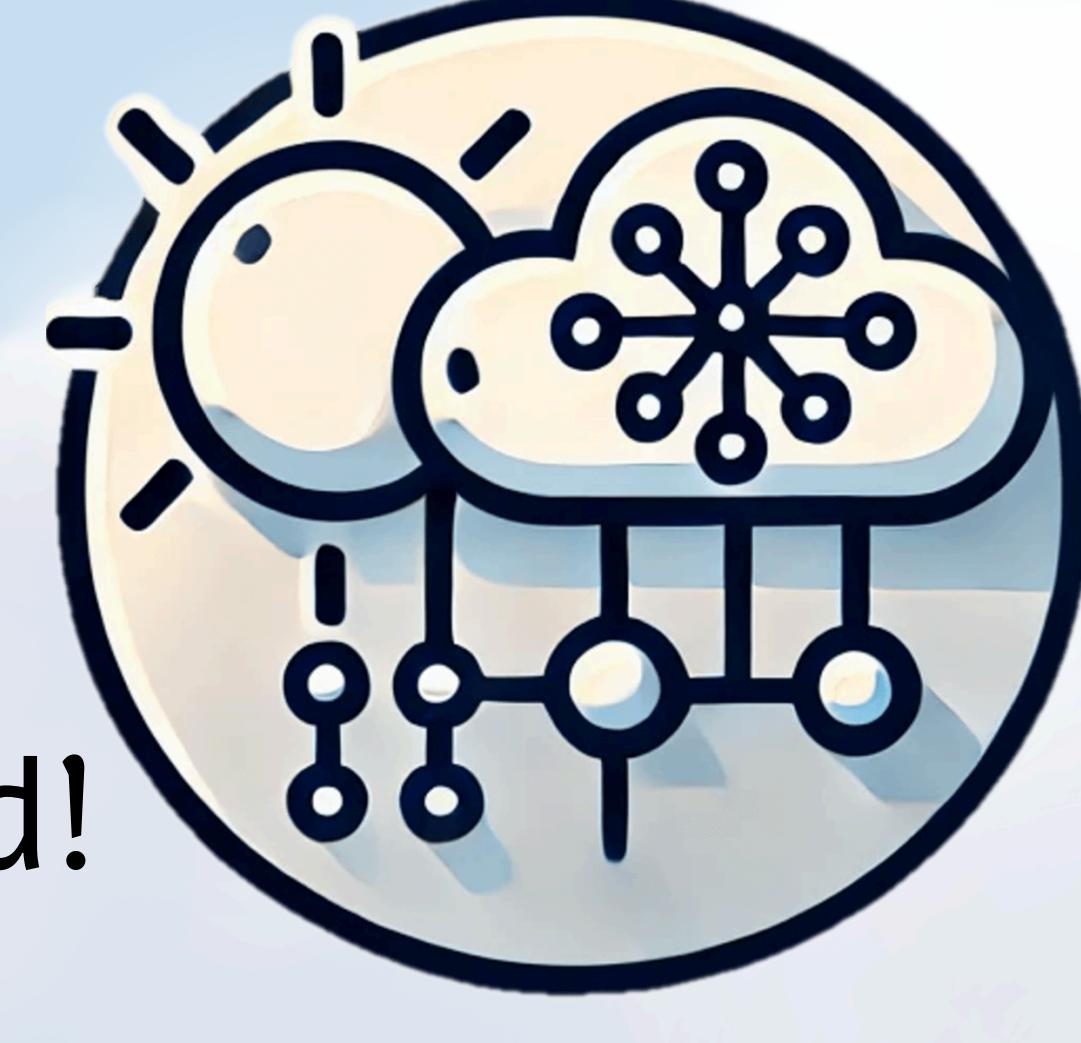
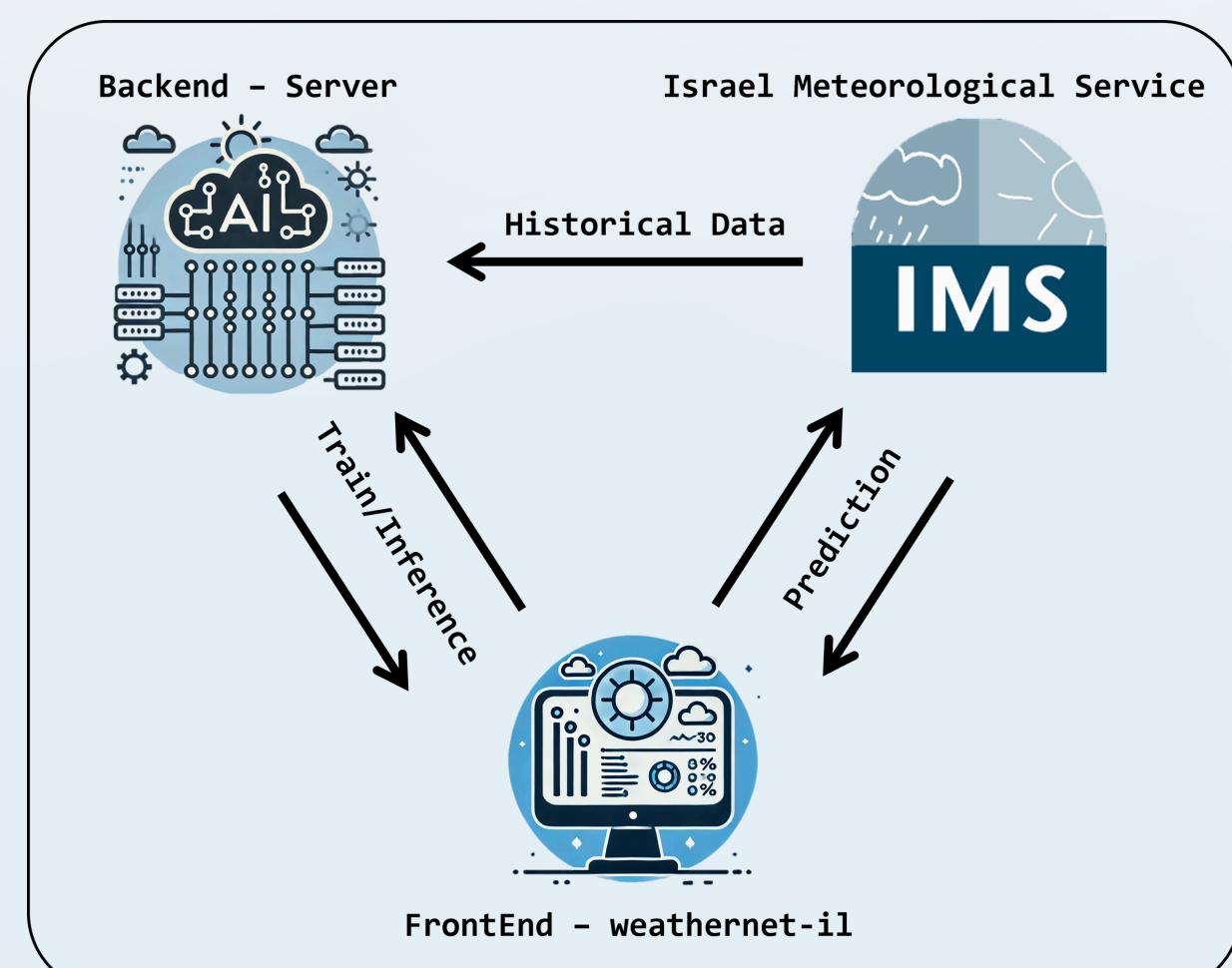


WeatherNet



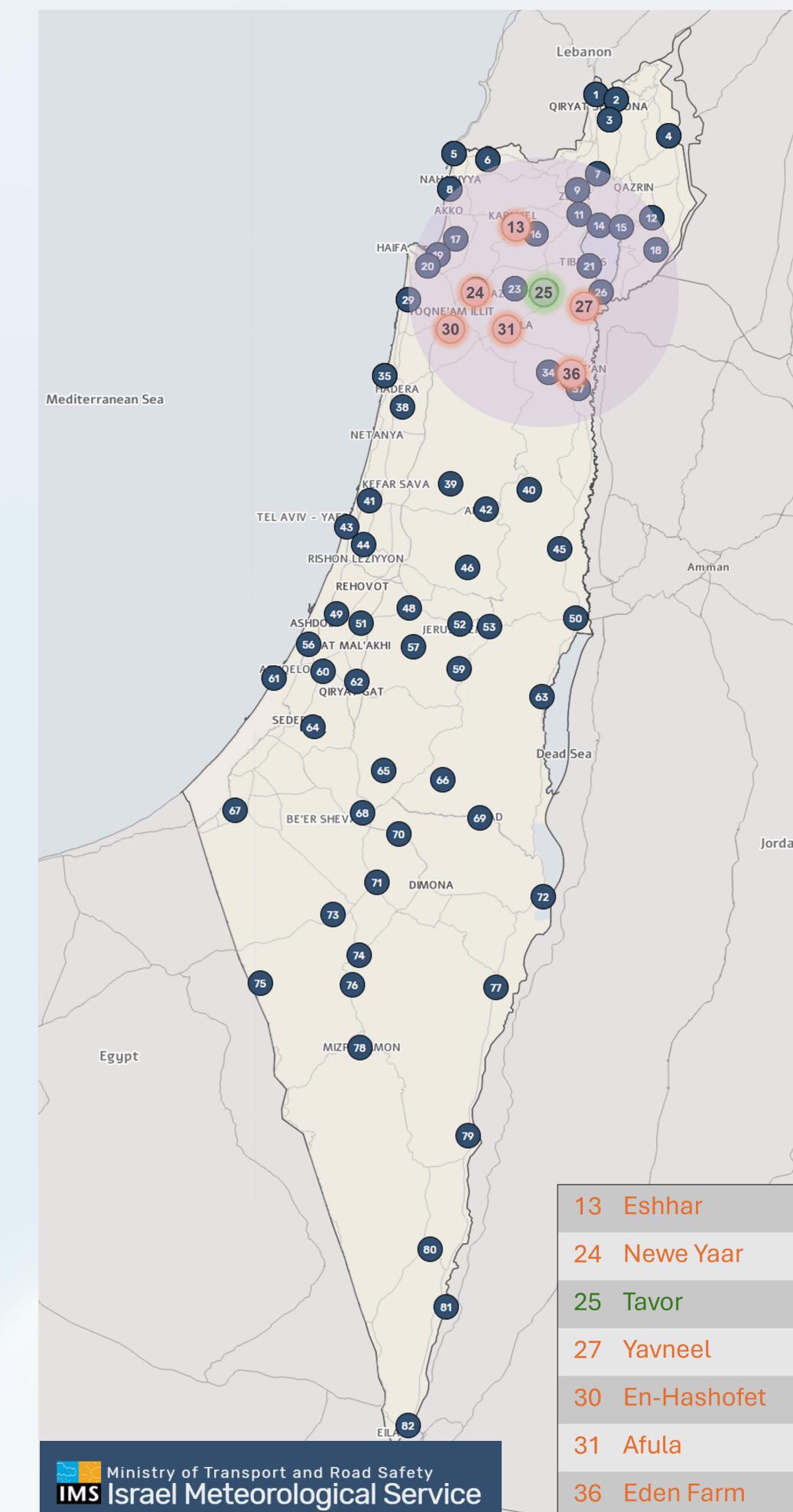
When Mother Nature's being indecisive, we've got you covered!

WeatherNet is a machine-learning-based weather forecasting system providing temperature predictions for Israel up to 60 hours in advance. Using IMS data, its CNN-Transformer model captures spatial and temporal patterns, delivering intuitive forecasts via a user-friendly platform.



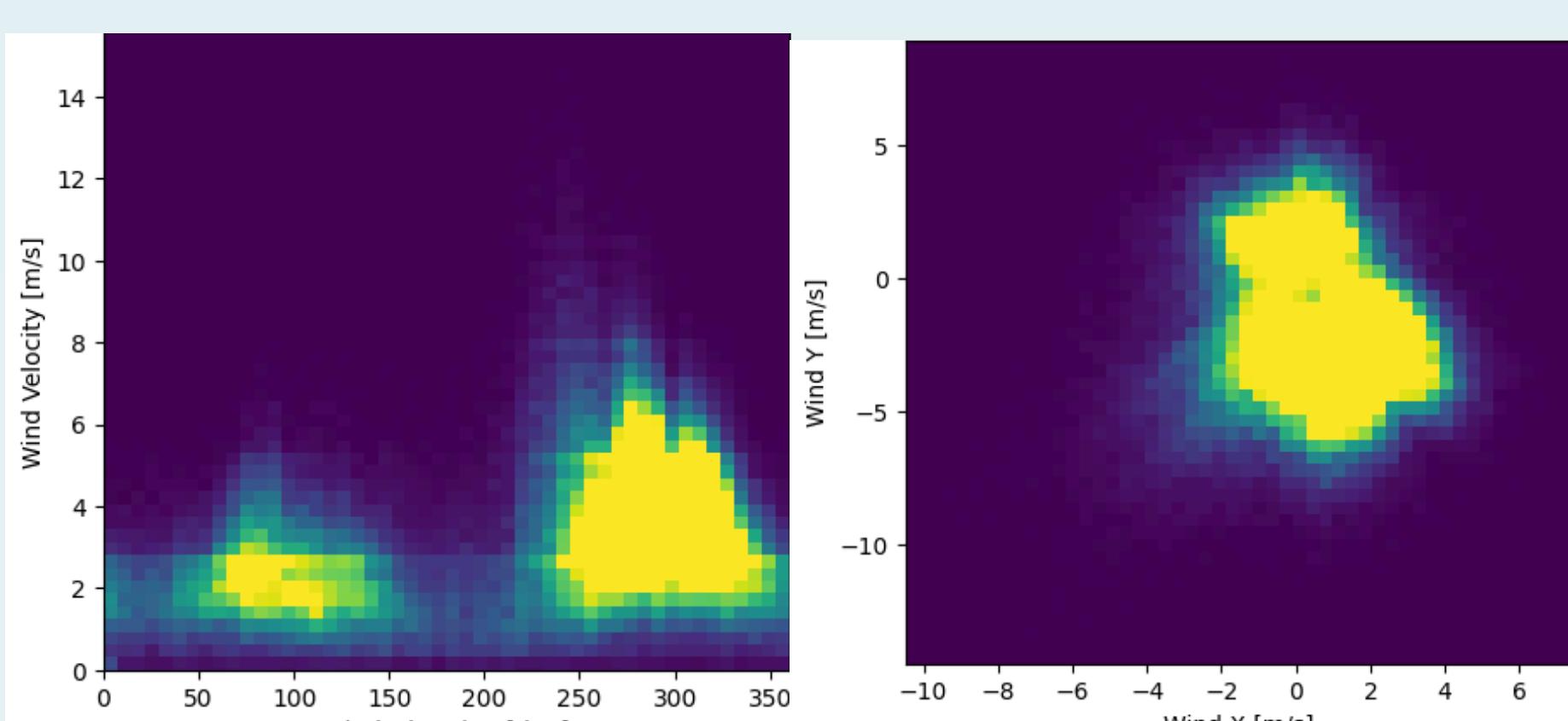
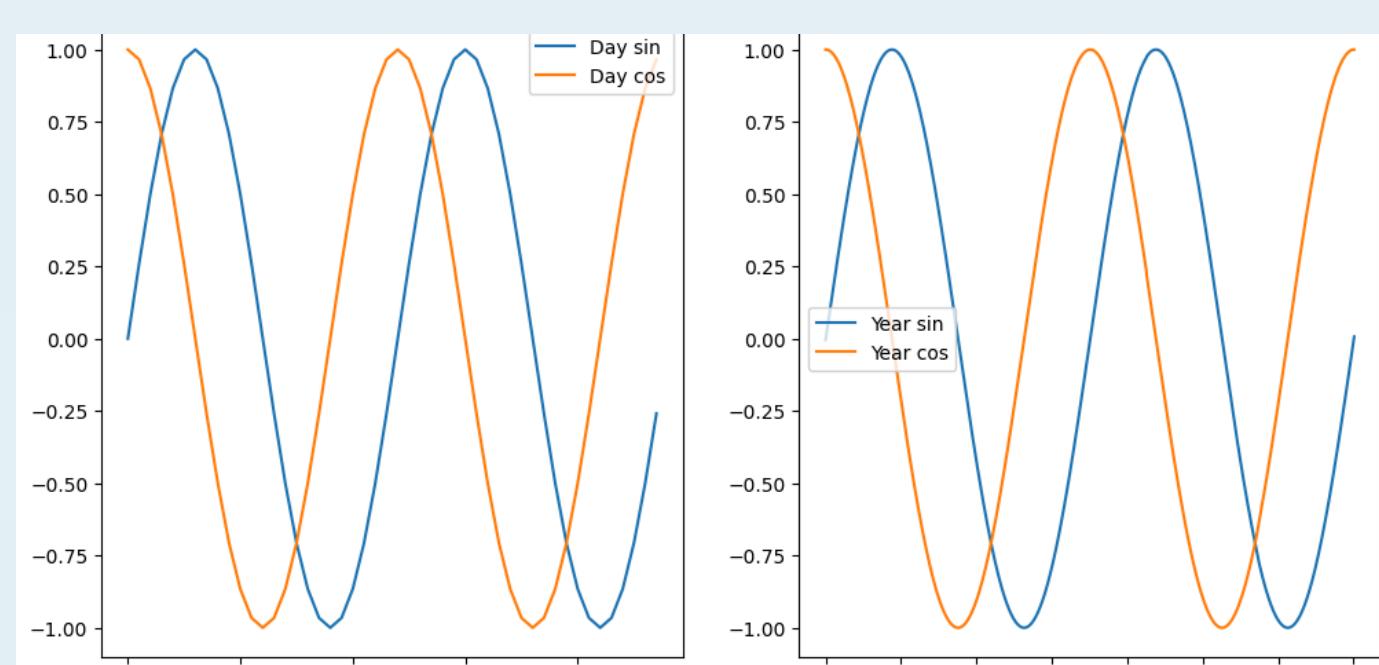
The system has two main components:

- Backend: Trains the PyTorch-based model and generates weather predictions.
- Frontend: A React-based platform for users to access forecasts.



Data Preprocessing

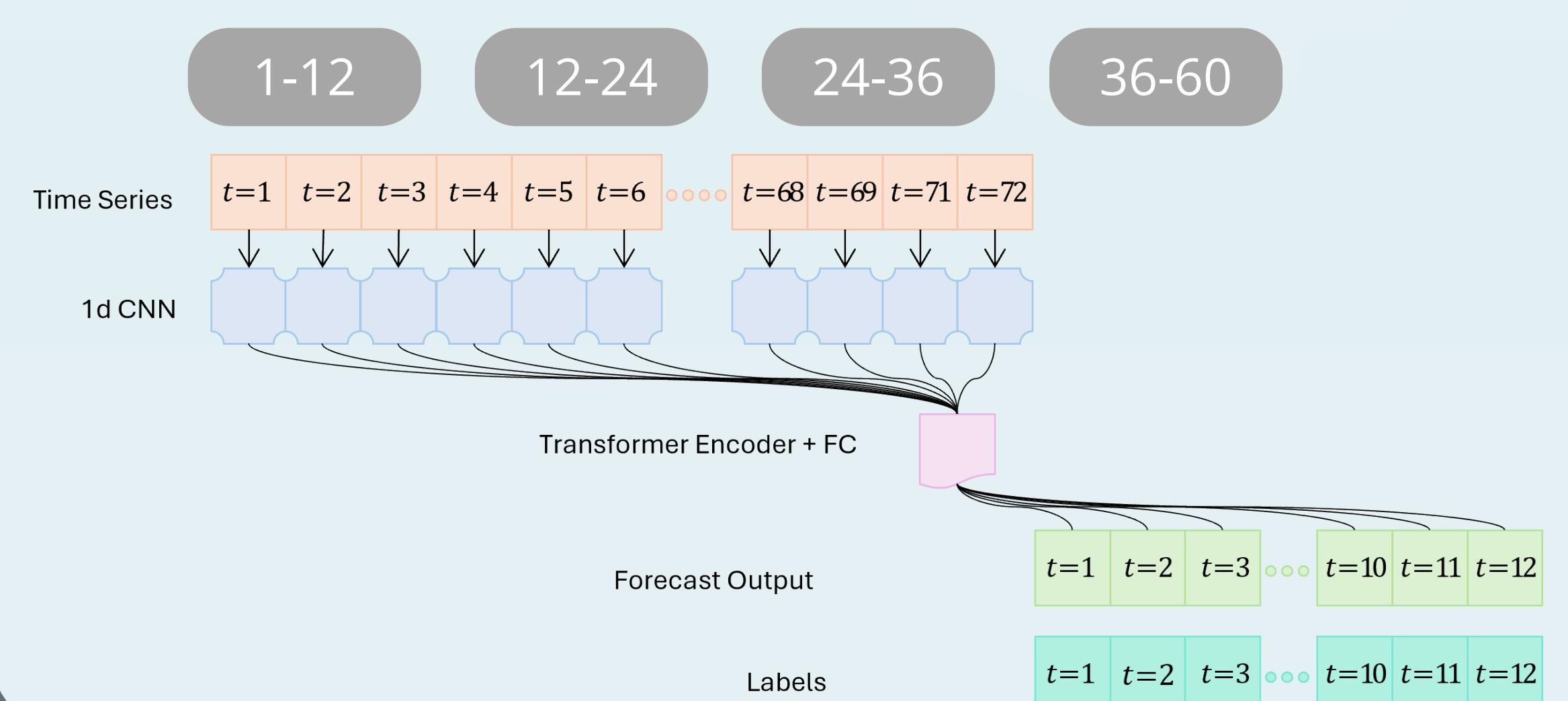
Cyclic Time: Time data is encoded with sine and cosine to preserve daily and yearly cycles.



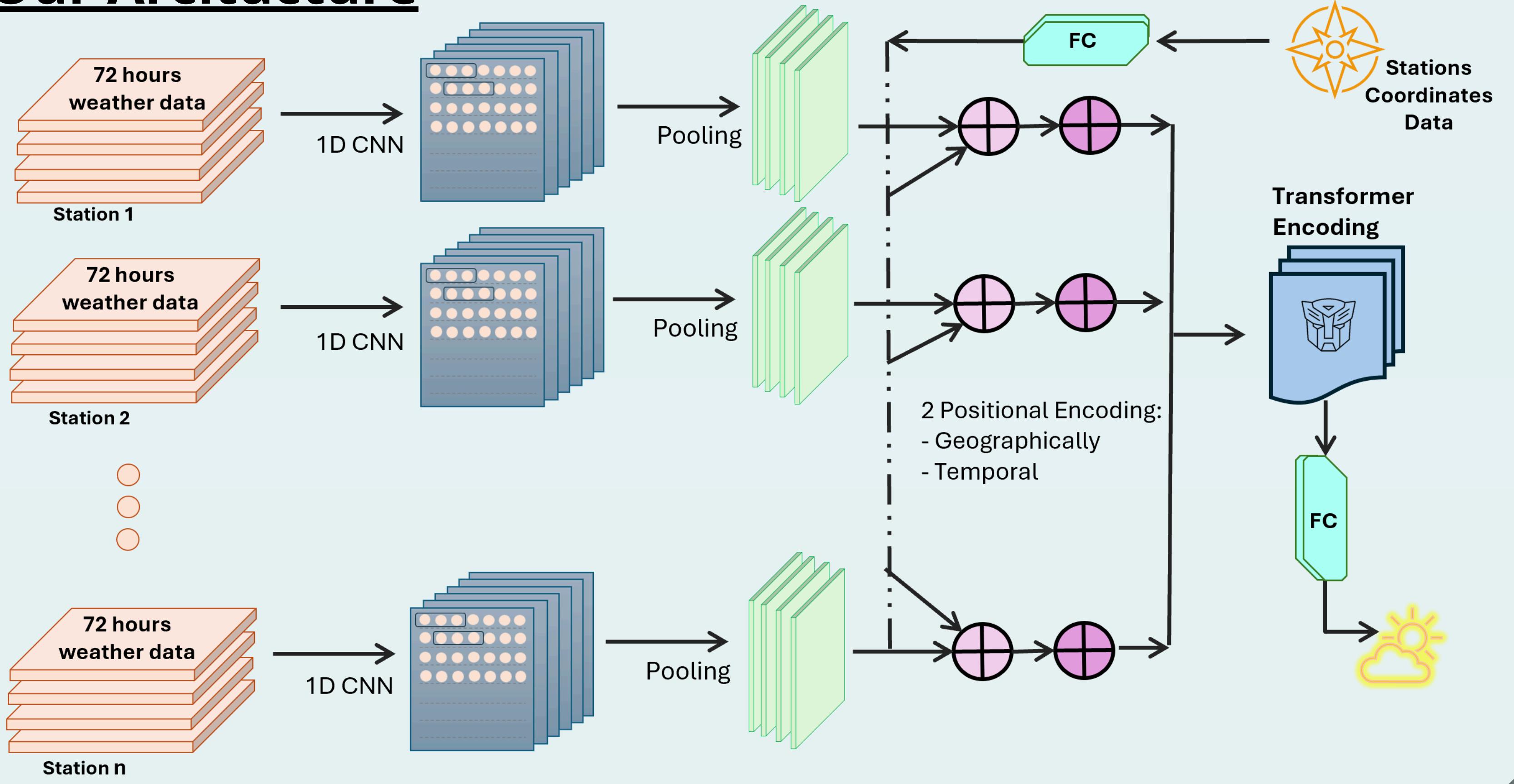
Wind Vectors: Wind speed and direction are vectorized to unify 0° and 360°.

Hybrid Model

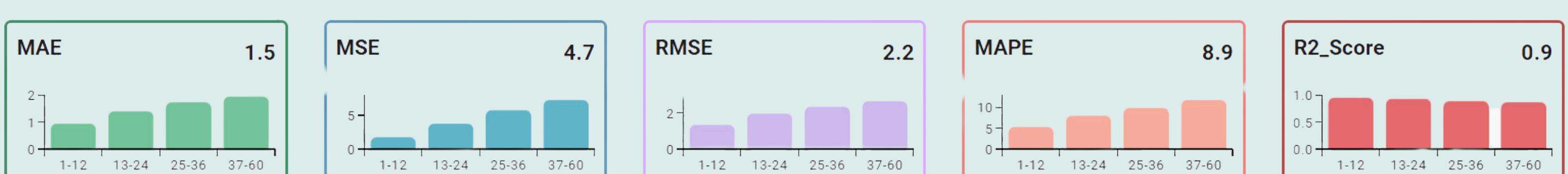
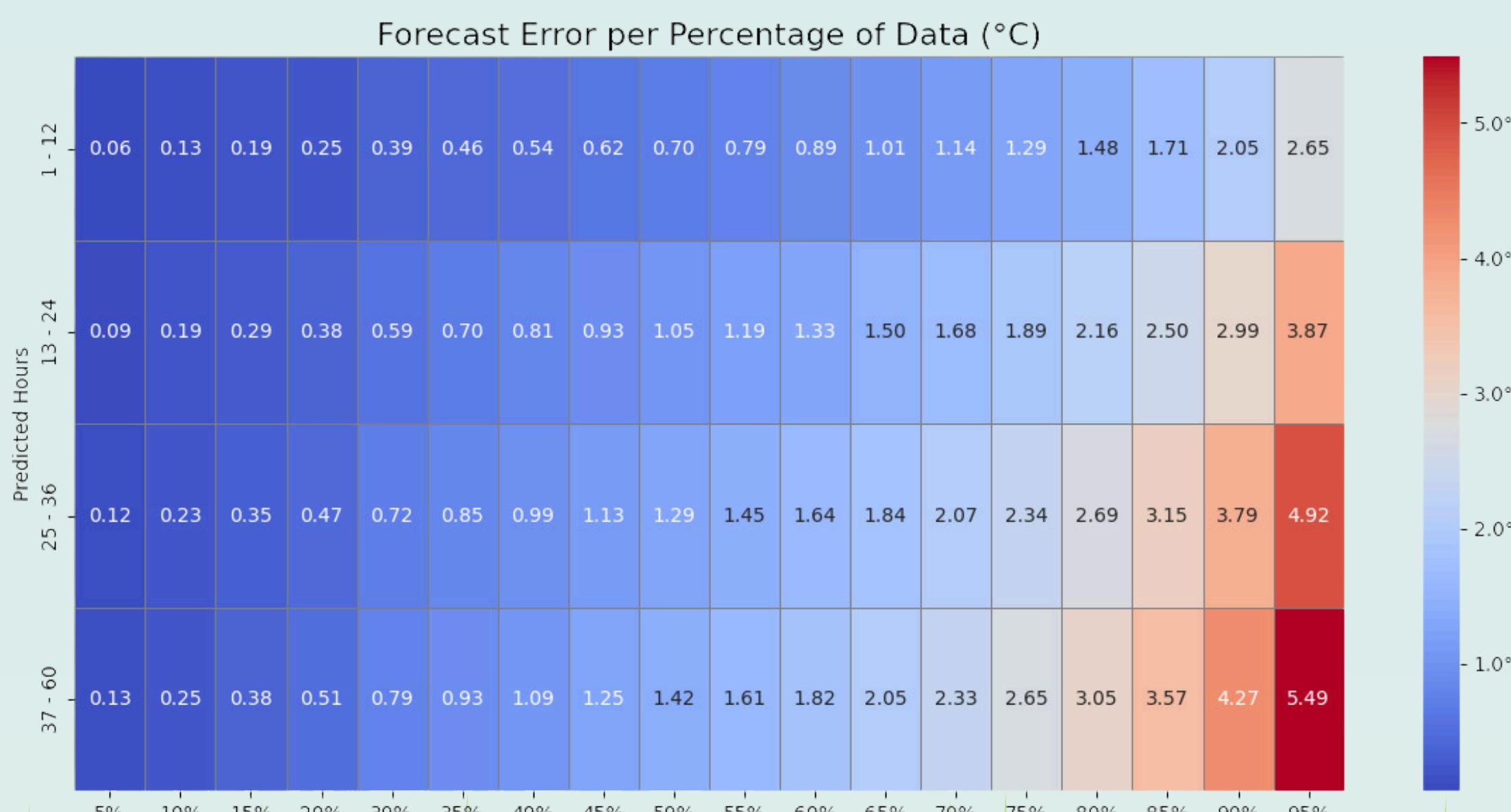
Our hybrid architecture predicts weather using four specialized models, each optimized for different forecasting ranges.



Our Architecture



Results



As expected, forecast accuracy is highest for short-term predictions and gradually declines over longer time horizons.